‘All That Is Solid…’: Climate Change and the Lifetime of Cities

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As critical urbanists confront climate change, and prospective climate responses, we must ask crucial questions about the ‘lifetime’ of today’s urban fabrics and metropolitan forms. How durable or ephemeral will existing urban geographies prove in the face of societal devaluations and destruction associated with climate change? Will breaks in and with existing urban forms be suffered through climate change impacts, or waged proactively in the name of deep decarbonization? Dystopian climate imaginaries present such material ruptures, mass stranding of real estate assets, and ‘premature death’ as an existential urban crisis. I maintain here that they are, rather, business as usual for urban capitalism, and its own longer-unfolding crisis. Property developers and appraisers have frequently truncated the lifetime of urban built environments, in how they have represented buildings and their long-term value—and non-value—and in how these representations have become material fact. I consider some bodies of critical urban scholarship necessary to exploring such processes and their climate significance, an important task for *City* going forward. I argue that this charge demands creative engagements between cultural geography and political economy, including on questions such as sometimes deep-rooted ‘fiscal geographies’ of urban disposability and emerging geographies (and crises) of property insurance.

Keywords: climate change, urban futures, building lifetimes, fiscal geographies, insurance

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The last few years have been a challenging moment for forecasting urban futures, and the critical tools needed to help drive them towards justice. Beyond the uncertain outcomes of political turbulence across many regional contexts, this opacity has manifested in important ways around the ‘urban Anthropocene’ (Derickson 2018) (or Capitalocene). On the one hand, popular apprehension of climate change’s power to destroy existing cities and urban ways of life is higher than ever before. Frequently, such anxieties are expressed in dystopian language. Meanwhile, mainstream financial sector discourses on ‘stranded assets’ increasingly echo critical interventions like Sayre (2010), as investors begin to grasp climate change’s capacity to massively devalue real estate and fixed capital. Similarly, supporters defending the major upfront price tag of a Green New Deal, or any program ambitious enough to substantially mitigate climate change, have a growing number of high-cost climate disasters to counterpose—for example, urban property losses from recent wildfires and mega-storm events that are now estimated in the billions of dollars. Still other actors look to climate change responses as a force for large scale devaluation. Capitalism’s past history of uneven development and Schumpeterian ‘gales of creative destruction’ suggests the premature end decarbonization might make of fossil fuel infrastructures and reserves (Knuth 2017). Finance-

targeted projects such as the UK's Carbon Tracker Initiative are now actively working to formally translate such prospective devaluations and codified 'transition risks' into mainstream investment practice.

On the other hand, as I will argue in this intervention, it is not clear that commentators, public-facing or scholarly, have fully taken on board one of climate change's fundamental qualities. Elemental to its challenge is the fact that it has been with us all along. As critical urbanists have scrutinized cities and urbanization processes, they have encountered climate change's driving forces in ways obvious and under-recognized. Greenhouse gas emissions have never *only* been about fossil fuel industries or their infrastructures, or other necessary sectoral targets for downscaling, degrowth, and devaluation. Rather, emissions take shape through urban fabrics, and the embedded sociomaterial practices they shape (as long argued by researchers such as Bulkeley 2019 and Shove and Walker 2010). More *City* contributors and readers must take up the cause of decarbonizing urban forms, and doing so in just ways. Useful here is Daniel Aldana Cohen's (2017) recent call-to-arms to '[look] beyond everyday labels… since everyone's actions have ecological consequences, *we should understand everyone as an ecological actor, just as we treat everyone as an economic actor*' (pp. 143-4). Climate change must be relocated from a still frequently haphazard or technocratic concern in urban journals to a central critical priority (Bulkeley 2019). It is clear enough today that such a move represents anything *but* a 'post-political' (Swyngedouw 2010) stifling of multivalent urban debates and conflicts—despite an ongoing need to scrutinize political projects legitimated through discourses of climate emergency and inevitable ruination (Paprocki 2019). Rather, it is a necessary summons to join actually existing struggles that will shape just urban and planetary futures, and the possibility of those futures (see, for example, Aronoff et al. 2019, Ranganathan and Bratman 2019, Rice et al. 2020).

Seeing Urban Fabrics and Lifetimes

Grand biological metaphors of life and death, wails of decay and shouts of revitalization are nothing new in urban historiography, certainly in the North American tradition (Heynen et al. 2006). Yet quieter, finer-grained questions of the manifold lives, deaths, and sometimes afterlives of *buildings* and urban fabrics remain still less frequently taken up by urbanists. This remains true despite the frequently galvanizing insights contained in accounts that deploy this lens into urban process. Scholars have asked how buildings die (Cairns and Jacobs 2014) and are unmade (Arrigoitia 2014), and how they 'learn' and are adaptively reused (Brand 1995). Some have explored how they become loci of more-than-human ecologies and increasingly permeable inside spaces—often in and through their biological metabolization and entropic physical degradation (Day Biehler and Simon 2011). Sometimes, they decline into obsolescent hulks (Abramson 2016), or 'blighted' vectors of urban decay (Weber 2002). In other places and moments, they ripen into fresh speculative value (Knuth 2017, Tapp 2019). Throughout, they are repaired and reproduced over time through formal or informal means—geographically variable, racialized and classed terrains of practice across 'Southern' and 'Northern' urbanism (e.g., Harris, 1991, Groth and Bressi 1997, Graham and Thrift 2007, Silver 2015, Caldeira 2017, Millington 2019).

As I have argued elsewhere (Knuth 2019), buildings' relative obduracy or ephemerality must simultaneously guide how we see decarbonization processes and climate futures. The significance of building lifetimes for emissions varies according to many contextual factors. These might include, for example, the carbon intensity of a city's electricity grid, conditions of access to that grid and other energy entitlements, norms of construction and building technologies such as air conditioning, and existing climatic patterns. Practices of living and working in physically degraded spaces can shed wasted energy and emissions into a building's surrounds—a strong case for building retrofitting and repairs, particularly for the energy-poor. Meanwhile, destruction, demolition, and (re)building are moments of intense energy and resources demand. Such material ruptures may be prompted by slow degradation and disrepair within urban fabrics. Equally, they may be driven by profit-seeking discourses of obsolescence and speculative redevelopment, or acute disasters like mega-storms and wildfires. These processes may effect a kind of 'premature death' (to appropriate Amartya Sen's concept) upon buildings and urban forms. Such foreshortened futures and breaks may lapse into abandonment, or may elsewhere compel new development. Decisions made while remaking urban built environments will shape the longevity and ongoing climate significance of these spaces. For example, how much will be invested in building qualities like structural soundness? What specific energy-consuming or passive technologies will be put in place? What relations will a new building have to its site, and its site to a broader urban fabric?

The above questions sit within a broader discussion that has frequently occupied critical urbanists: the question of whether urban political economy and various strains of cultural geography should mutually inform or depart from each other in exploring such socio-technical relations—or, more constructively, how, and in what sites and places. The processes referenced above are inherently material and biophysical as well as regionally specific, sociocultural and political economic. Many were central concerns for vernacular architecture, cultural landscapes scholarship, and regional geographic traditions (e.g., Groth and Bressi 1997) before their renaissance across urban and cultural geography today, typically in more recent (re)discoveries through the lens of Actor Network Theory (ANT). Without exhaustively rehearsing a history of debates in and beyond *City*'s past (though see, for example, McFarlane 2011, Brenner et al. 2011, Ranganathan 2015, Demaria and Schindler 2016), it is safe to say that urban political economy's place remains somewhat ambiguous in these explorations. Particularly, the predominance and normality of urban informality, its more and less ephemeral built fabrics, everyday repair practices, and displacements by fiat have provoked scholars of Southern cities to question the adequacy of urban political economy's existing toolkit—preoccupied as it often is with processes like gentrification that have traditionally been imagined to work though formal land tenures and property markets (Ghertner 2015).

One useful takeaway among others from these discussions of the recent past is that it is imperative to question in open and inductive ways the differences that formality and formalization make within urban fabrics, including to the lifetime/s of buildings under climate change. Under such processes, I include here conjoined processes of commodification and state entitlement. Entitlement processes impart exchange value to plots of urban land as well as to its 'improvements' in the form of buildings and structures. They also mean qualification for

state-registered land titles and formal protections under property law, property taxation rolls if applicable, variably state-mandated property insurance schemes, and so forth. Critical urban scholars must continue to scrutinize mainstream narratives of 'resilient' informal communities and infrastructures, which may well be badly under-resourced and exposed to unapologetic state displacements, exclusions, and malignant neglect (e.g., Amin 2013, Yarina 2018). However, it is likewise crucial to question formality's limits and limitations in the face of climate change. The former lie, for example, in its ongoing constitutive gaps and exclusions across Northern cities—particularly, though not exclusively, for the racialized poor. They also become evident in mounting fears that climate change impacts may swamp existing institutional structures (ones often already badly stressed by decades of neoliberal austerity). Simply put, the basic mass entitlements of formality may just not be what they used to be, particularly in previously assumed protections for the longevity and value of built structures. This is true even in rich cities and countries. For example, US state-supported property insurance programs against flood risk show major strains (Elliott 2017). Accordingly, 'managed retreat' from exposed coasts and their dense land and property regimes has become an increasingly thinkable proposition (prompting many questions of its unequal accessibility and benefits) (Koslov 2019).

The latter, formality's *internal* limitations and perverse effects, are where I suggest many of political economy's keenest insights into building lifetimes and their foreshortenings lie. Formalizing and commodifying land, property improvements, or the urbanization process is of course no guarantee of new durability and permanence for urban fabrics. Rather, experience demonstrates that entrance to worlds of market comparison and entrainment in state capitalist projects can heighten the ephemerality of urban forms.[1] This rendering-impermanent goes beyond the flexibility-in-waiting that is to some (arguable) degree an essential feature of capitalist property regimes, in which 'all that is solid melts into air'. Hardly limited to Berman (1983) (and Marx, of course), that quality may be discussed in terms of land as a financial asset under capitalism (Harvey 1982), land as a fictitious commodity (Polanyi 2001 [1944]) or what I have called elsewhere (Knuth 2019) the 'ruination-as-usual' of capitalist uneven development. Regardless of terminology, this enforced flexibility all too often means sacrificing buildings' use values to accumulation imperatives and speculative possibilities, including ones that prematurely devalue, degrade, and destroy the spaces that attach and enable them.[2] All such processes of urban churning and spatialized creative destruction impose uncounted, perhaps uncountable climate costs—one among many structural drivers of the crisis inadequately pictured by mainstream practices of inventorying emissions (for other examples, see Cohen 2016, Belcher et al. 2019).

[1] And see, for example, Right to the City-influenced work on use values versus exchange values under formalization processes (e.g., Fawaz 2009).

[2] For example, evolving *capitalist* variants of the predatory landlord (alongside pre- and non-capitalist forms) as a speculative under-maintainer of buildings, from Engels' Manchester (1845) [2009] to 21st century New York and Berlin (Fields and Uffer 2016, Teresa 2016), and far beyond.

Formal Manipulations: Making [Buildings] Live and Letting Die?

What I suggest may be particularly interesting to critical urbanists facing the climate crisis are more deliberate moments of formal manipulation, interventions at key conjunctures that have rippled through broad landscapes and logics of city-building. This power to write and overwrite norms of building lifetime at scale is an important if geographically variable ability of formalized property regimes. Its impetus has historically come from the state, capitalist property interests, or both (and despite the considerable inertia that urban fabrics and embedded practices can exert). Often, urban political economists have encountered it as a negative force, for example through the experience of racial redlining in the United States (e.g., Freund 2010, Gibbons 2018). Such state-supported exercises of racialized classification and downgrading excluded older urban neighborhoods from investment for construction and repair, and hastened degradation of their urban fabrics. Meanwhile, they kicked off sprawling, emissions-intensive booms in other metropolitan zones (and see Castree and Christophers 2015 on new and old 'fix' logics in such projects). Today, critical urbanists have cause to hope for a more generative, climate-responsive exercise of this state power over urban space, as Green New Deal advocates propose a raft of ambitious new housing programs. As such, it is important to continue exploring precisely how and where targeted interventions can reshape urban fabrics and their longevity, especially in service of more just climate futures. Although answers will be necessarily context-specific, I conclude with two brief examples from the United States.

Fiscal Geographies for Decarbonization

US urbanization, and the quality and longevity of buildings produced in various times and places, have been indelibly shaped by what Tapp and Kay (2019) term 'fiscal geographies', shifting compulsions and speculative openings of the US tax code. In the aftermath of a new, hastily implemented round of Republican tax cuts by Donald Trump, the power of the tax code to shape space is again a topic of major concern. For many, the 2017 tax cuts have recalled similar programs of the Reagan Administration, especially the Economic Recovery Tax Act (ERTA) of 1981. As critical urbanists have explored and are taking up in new ways today (e.g., Fainstein 1994, Weber 2015, Tapp 2019), ERTA created a host of real estate tax shelters in manipulations of buildings' paper value and lifetime. These formal representations helped spark a massive US property bubble, overbuilt landscapes of 'see-through buildings', and a near-systemic crisis. Understanding fiscal logics, in such acute crises and more chronic effects, helps illuminate why some US buildings and physical plants have been 'built to last', while others emphatically have not. For example, the exurban 'big box' retail landscapes of the 2000s US property bubble were infamously disposable and are already crumbling.[3] These explorations clarify the existing decarbonization challenge in the US built environment—such building waves shape future climate maintenance and retrofitting demands, and urban fabrics' greater and lesser tractability for repair and repurposing (Knuth 2016, Knuth 2019, Stehlin 2019). Moreover, they crystallize what US regulatory structures and tax code elements are most in need of reform and structural overturning today.

[3] Notwithstanding communities' efforts to repurpose these frequently vacant and abandoned spaces, often amid broader landscapes of urban and rural disinvestment (Christensen 2008).

For example, to understand the power to redirect huge swathes of building activity that can occur from a few simple-seeming tweaks to a tax code, the case of 'accelerated depreciation' in the United States is another prime example (part of ERTA's bubble logic but also long predating it). As Thomas Hanchett (1996) illuminatingly argued, in the early 1950s the Eisenhower Administration utterly transformed commercial real estate development in the United States with the slash of a pen—what observers portrayed as a combined outcome of savvy industry lobbying and sheer happenstance. A provision initially intended for manufacturers to 'write down' for tax purposes some of the value of their investment in industrial fixed capital, accelerated depreciation was unexpectedly transformed into a lucrative handout for commercial real estate developers. Its on-paper devaluation schedule permitted developers to claim major tax write-offs, while formally restricting the usable lifetime of buildings to forty years. At the end of that period, buildings would be presumed valueless, and physically degraded so much as to be unusable.

Crucially, this notion of a forty-year building lifetime was always an appraisers' fiction, despite the terminology's air of natural law. With ongoing maintenance, buildings may live for far longer and continue to appreciate in value. Notably, middle class US homeowners' livelihood security has often depended upon that assumption (and see Knuth 2020). Nevertheless, this formal lifetime had clear performative qualities. As urban historians like Hanchett have demonstrated, the representation and its uptake began to foreshorten building lifetimes in fact; for example, for retail spaces. In the meantime, it created a playbook of real estate tax sheltering practices. Subsequent US speculators have utilized and elaborated upon these schemes. For example, in the 1980s property boom, investors were able to use paper value 'losses' from buildings to offset taxes from other activities, while still speculating on buildings then rapidly becoming *more* valuable. Hanchett argues that such paradoxical value games, initially applicable only to greenfield development, were crucial to the US suburban shopping center boom of the 1950s-1960s. With postwar highways and state-subsidized (again partly via the tax code) low-density residential suburbs, these are key landscapes undergirding US greenhouse gas emissions and emissions waste today—all the more so as they degrade and die.

Insuring Urban Coastal Futures?

Such synoptic powers over urban fabrics are equally important in readying them for the impacts of climate change—some now inevitable and already arriving. Urbanists will confront these urban transformations in differentiated experiences and struggles on the ground. Mass property destructions and devaluations from mega-storms, wildfires, and other acute climate change-intensified disasters will encounter more chronic destabilizations and truncated urban futures. In programs to reimagine climate response within buildings and urban form, the experience of Hurricane Sandy in New York City continues influential. Following on experiences after Hurricane Katrina in New Orleans, Sandy ushered in fresh forms of property-based 'disaster capitalism' in gentrification and infrastructural speculation (Greenberg 2014). Similar programs continue to be rolled out around new mega-storms—with Hurricane Maria in Puerto Rico a disquieting recent test case (Klein 2018, Bonilla and LeBrón 2019, Arrigoitia 2019). 'Rebuilding by design' after Sandy (Collier et al. 2016) proposed new forms of defensive urbanism for places like Manhattan and for property owners and investors with the ability to

pay for it. Meanwhile, it pioneered new propositions for 'managed retreat', more and less state-supported for other places and populations (Koslov 2019). Crucially for our purposes, post-Sandy designers rolled out a host of new proposals for more individuated building-level defensibility and longevity, behind the ostensible zonal protections of levees and seawalls (and see Yarina 2018).[4] Such visions of adaptive architectures, micro-grids, and the like have important power to shape how buildings are (de)valued and (non-)maintained in the face of climate change.

More significant still, emerging geographies of insurance, non-insurability, and insurance-linked financial innovation around climate risk stand to fundamentally reshape the lifetimes of buildings and urban fabrics in many places, existing and potential. Critical interventions from scholars such as Johnson (2015) and Taylor (2020) now explore how novel insurance schemes proposed as climate change solutions may in fact compound mass devaluations and erasures to come. This research explores ways in which innovations advance promises of future insurability and manageable risk for highly climate-exposed cities and property markets; for example, those of coastal Florida. Often, they do so via generating exotic financial instruments and new pathways to capital markets. Scholars argue that such supposed innovations may exacerbate climate change's long-term threat by staving off devaluation and abandonment in the present, thereby facilitating *increased* building in tenuous environments. Devaluations and destruction to come will thus carry a heavier cost, one all too likely to be borne at the final instance by the state. Meanwhile, as Taylor explores in depth, these schemes are bolstering Florida's real estate speculation-dependent regional economy. They offer a screen behind which investors may continue to extract value from buildings before mounting biophysical destabilizations and structural transformations foreclose upon these spaces. Once again, formal, performative manipulations of (future) value are deployed here in the service of property-based accumulation. And yet again, these representations may produce heightened building and landscape-level disposability. In the process, such profligate and time-delimited city-building *drives* climate change as well as exacerbating future exposures to it.

Conclusion

There are many more examples I might have cited in this discussion, both of the significance of building lifetimes for climate change response and of how such future possibilities are currently manipulated and foreclosed in contexts like the United States. For example, researchers might consider the broad rendering-disposable of and new speculative gambits for 'shrinking' Rustbelt cities. Alternately, they might explore how urban fabrics will encounter the sectoral asset-stranding, crisis, or managed disassembly of a carbon bubble (Knuth 2017). All such practices and developments raise the prospect of building and landscape-level devaluations at scale. With the Green New Deal and other ambitious policies on the rise in the US and beyond, it is a timely moment for critical urban scholars and activists to enlarge our optics for seeing the climate costs of inherited urban practices. Moreover, we must seize the opportunity to demand

[4] Alongside parallel imaginaries of *rural* defensibility-in-place now being advanced by international actors against the specter of the urban climate refugee, for example in coastal Bangladesh (Cons 2018).

far more conscious and strategic forms of urban valuation and devaluation. These revaluations may variously support demolition, preservation, or appropriate new construction.

The task of understanding these connections between formal valuation practices and complex urban materialities in place will continue to demand dialogue across urban cultural geography and political economy. Not every urban context will experience the sweeping formal recalculations surveyed in this discussion, that make urban political economy's toolkit particularly vital in understanding how US buildings live and die. Notably, the more diverse forms of urban tenure (Ghertner 2015) that characterize the majority world may be variably opaque to the kind of fiscal geographies and formal revolutions in appraisal chronicled here—though they may be reshaped by other sweeping state interventions such as large-scale demolition programs. Nevertheless, if the 'rules' governing the longevity of urban fabrics are necessarily place-specific, it is clear that they engage processes such as repair, maintenance, and demolition that are always simultaneously economic propositions (formal, informal, or perhaps something in between) and deeply culturally embedded practices. The durable material artifacts they work on or leave behind are similarly multivalent in their qualities and ability to anchor lives and livelihoods. Continuing to expand these conversations and explorations will be crucial in rebuilding more durable, just cities for an era of climate change—including, crucially, delegitimizing and overturning the ruinous disposability that has loomed over this discussion.

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